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Summary of Vegetation Guidance

Guidelines for Landscape Planting and Vegetation Management at Floodwalls, Levees, and Embankment Dams

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Background

- Prior to September 2006 inspection standards for federal and non-federal projects where not applied consistently.
- Vegetation standards in EM 1110-2-301 concerning vegetation and root free zones where not being following in planning, construction or O&M maintenance practices.
- A “Vegetation White Paper” was published in April 2007 that review current policies & guidelines for vegetation management and provided recommendations implementation of updated vegetation standards.
- Published interim vegetation guidance in June 2007. Established the inspection checklist as the inspection standard to be used for all federal and non-federal projects & clarification guidance on easement limits and riparian vegetation at the water edge.
- Established a PDT to update the Corps Guidelines for landscape plantings and vegetation on floodwalls & levees.

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Process Overview

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The revision of EM 1110-2-301 will be completed in two phases

- Phase I: A necessary first step **(to be completed in 2008)**
  - Purpose: Clarify our existing guidelines, which are somewhat ambiguous, and, in the process, identify unknowns that require further research
  - Products: (1) an ETL, and (2) a scope for required research

- Phase II: The real work **(start date TBD)**
  - Purpose: Conduct research to establish both scientific and engineering grounds to reaffirm and/or revise Corps vegetation guidelines, and to better accommodate ecological enhancements to FDR Systems.
  - Product: final guidelines, as an EM

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Process Overview

Project Team – Disciplines

Landscape Architect
Levee Design **(Civil / Geotechnical)**
Levee Design **(Civil / Geotechnical)**
Dam Design & Safety
Stream Restoration & Bio-Engineering
Operations & Emergency Management
Environmental
Research Specialist
Regulatory Specialist **(wetlands)**

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Phase I progress to-date

Accomplishments

1. Conduct Literature Review
2. Provide guidance for establishing and maintaining appropriate ground cover.
3. Provide guidance for removal of harmful vegetation and the treatment of animal burrows.
4. Clarify guidance defining what features constitute a levee that shall remain free of vegetation.
5. Clarify the text and graphics describing vegetation and root-free-zones.

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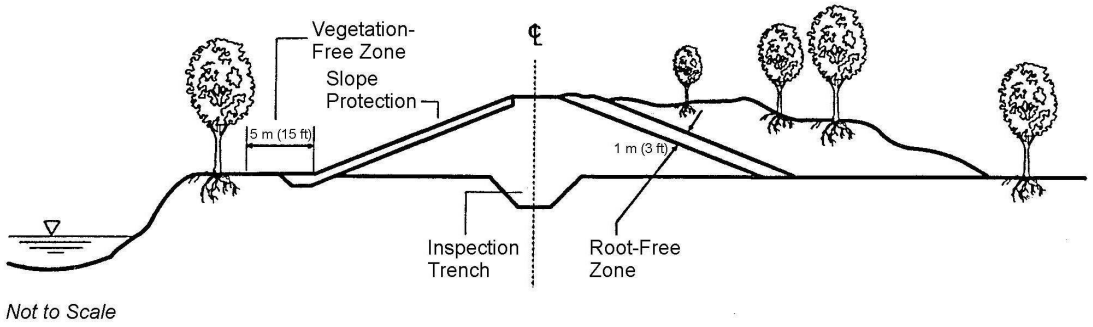
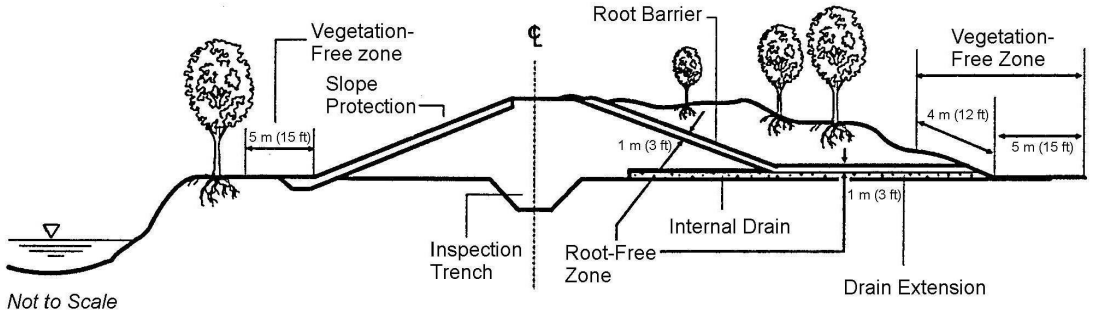
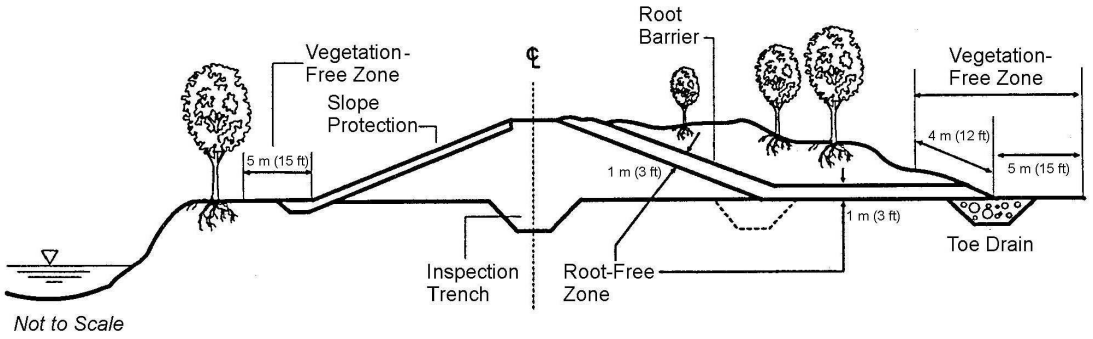


a. Vegetation- and root-free zones



b. Blanket drain



c. Toe Drain

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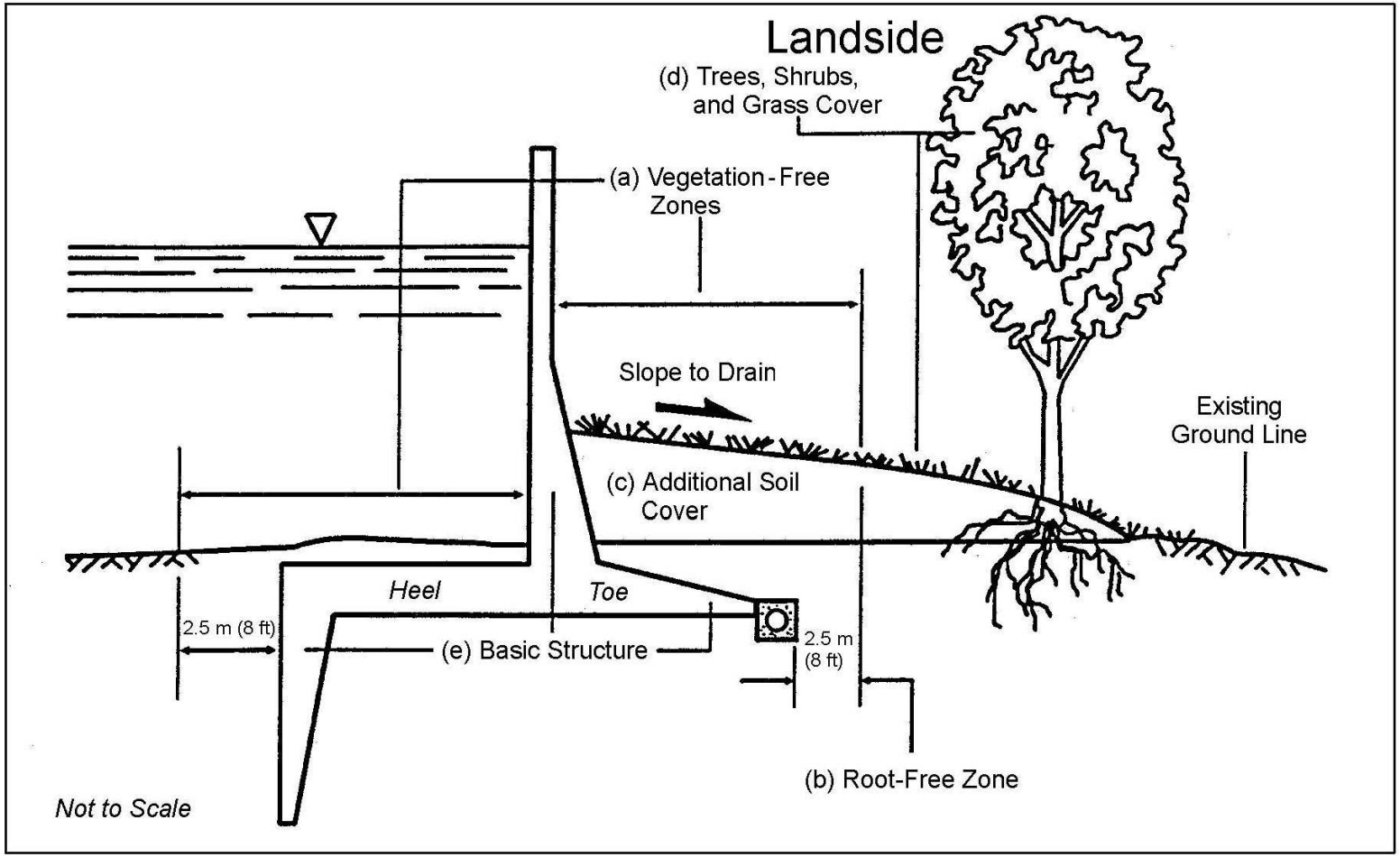
Phase I progress to-date



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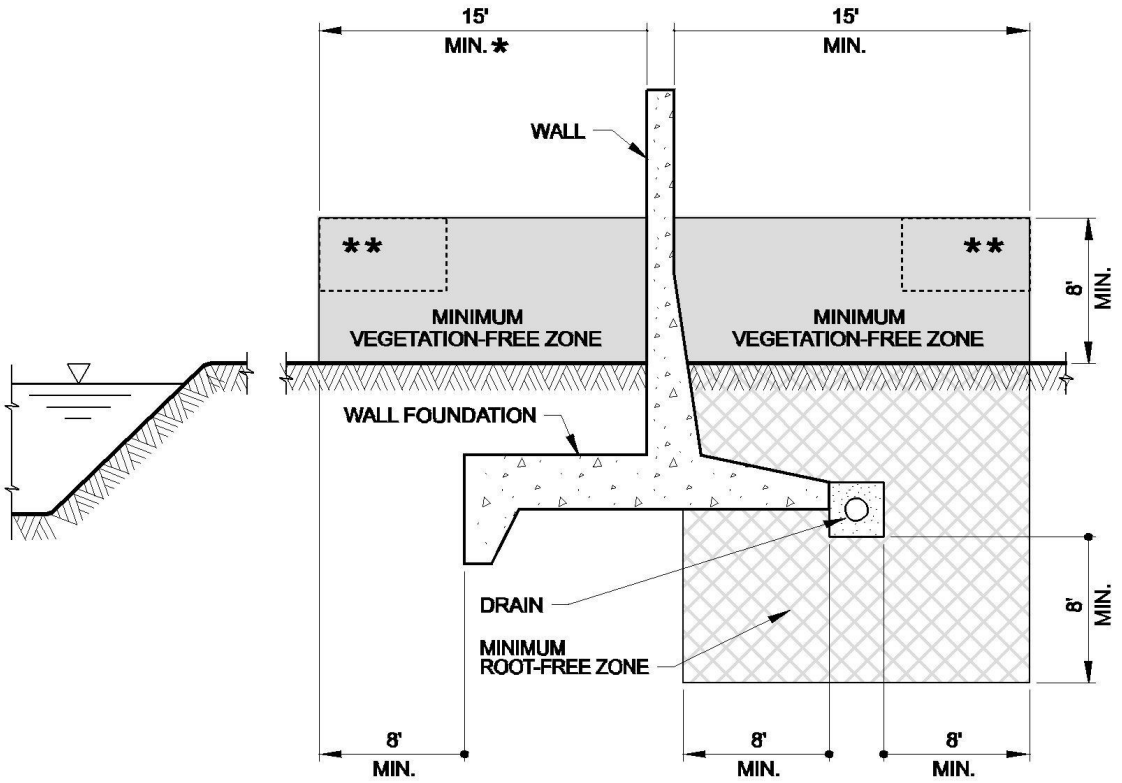

* 15' OR DISTANCE TO EDGE OF ORDINARY HIGH WATER, IF LESS

** IN THIS 4' X 7' TRANSITION ZONE, TEMPORARY OBSTRUCTION BY LIMBS AND CROWN IS ALLOWED DURING DEVELOPMENT OF NEW PLANTINGS, FOR UP TO 10 YEARS

▽ ORDINARY HIGH WATER

NOTE: THE HORIZONTAL DIMENSION OF THE MINIMUM VEGETATION-FREE ZONE SHALL BE THE GREATER OF:

(A) THE 15-FOOT MINIMUM, AS DIMENSIONED ABOVE GRADE; OR
(B) AS DIMENSIONED FROM THE BELOW-GRADE STRUCTURE

Figure 18: Inverted T-Type Floodwall with Drain

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Phase I progress to-date

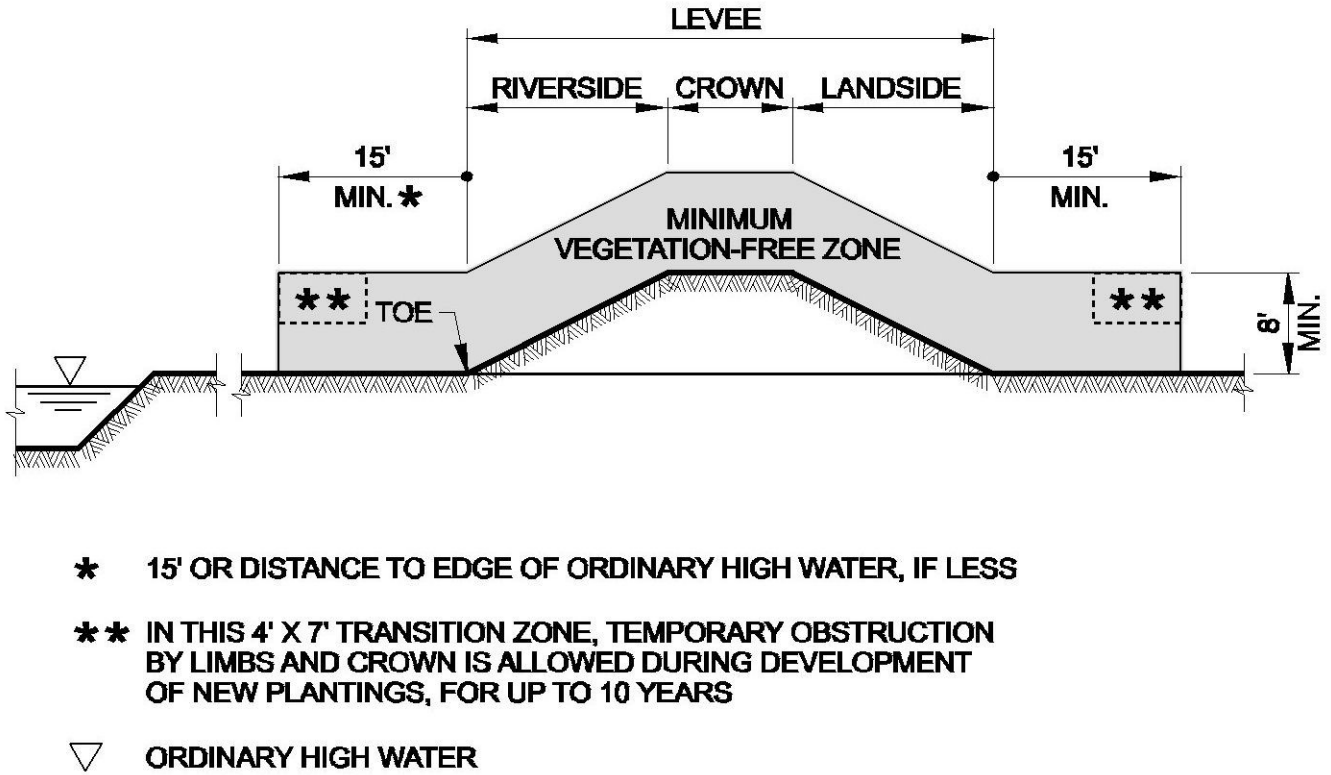

Figure 1: Levee section -- Basic

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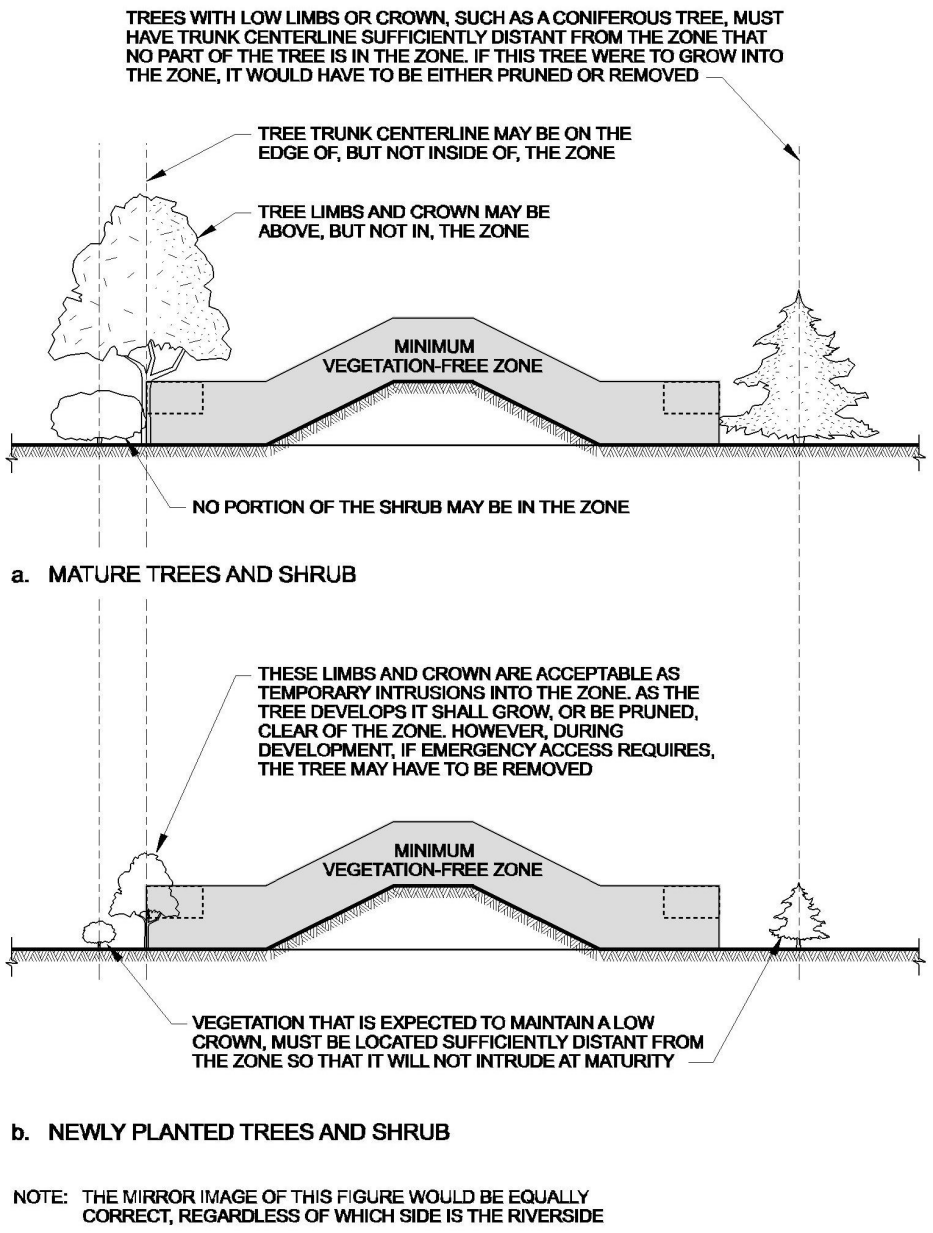
TREES WITH LOW LIMBS OR CROWN, SUCH AS A CONIFEROUS TREE, MUST HAVE TRUNK CENTERLINE SUFFICIENTLY DISTANT FROM THE ZONE THAT NO PART OF THE TREE IS IN THE ZONE. IF THIS TREE WERE TO GROW INTO THE ZONE, IT WOULD HAVE TO BE EITHER PRUNED OR REMOVED
TREE TRUNK CENTERLINE MAY BE ON THE EDGE OF, BUT NOT INSIDE OF, THE ZONE
TREE LIMBS AND CROWN MAY BE ABOVE, BUT NOT IN, THE ZONE
MINIMUM VEGETATION-FREE ZONE
NO PORTION OF THE SHRUB MAY BE IN THE ZONE
a. MATURE TREES AND SHRUB
THESE LIMBS AND CROWN ARE ACCEPTABLE AS TEMPORARY INTRUSIONS INTO THE ZONE. AS THE TREE DEVELOPS IT SHALL GROW, OR BE PRUNED, CLEAR OF THE ZONE. HOWEVER, DURING DEVELOPMENT, IF EMERGENCY ACCESS REQUIRES, THE TREE MAY HAVE TO BE REMOVED
MINIMUM VEGETATION-FREE ZONE
VEGETATION THAT IS EXPECTED TO MAINTAIN A LOW CROWN, MUST BE LOCATED SUFFICIENTLY DISTANT FROM THE ZONE SO THAT IT WILL NOT INTRUDE AT MATURITY
b. NEWLY PLANTED TREES AND SHRUB
NOTE: THE MIRROR IMAGE OF THIS FIGURE WOULD BE EQUALLY CORRECT, REGARDLESS OF WHICH SIDE IS THE RIVERSIDE

Figure 2: Proper Application of the Vegetation-Free Zone

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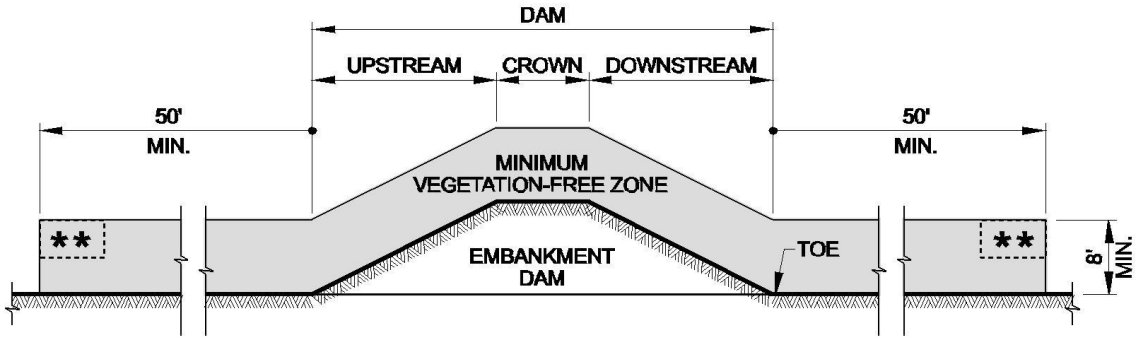
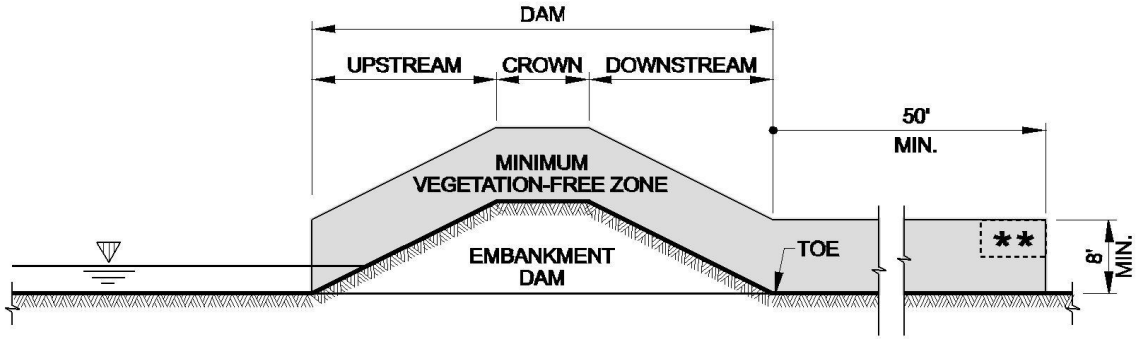


a. EMBANKMENT DAM WITH DRY RESERVOIR



b. EMBANKMENT DAM WITH NORMAL POOL

** IN THIS 4' X 7' TRANSITION ZONE, TEMPORARY OBSTRUCTION BY LIMBS AND CROWN IS ALLOWED DURING DEVELOPMENT OF NEW PLANTINGS, FOR UP TO 10 YEARS

NORMAL POOL

Figure 21: Embankment Dam (Earth Fill, Rock Fill, Earth and Rock Fill)

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Phase I progress to-date

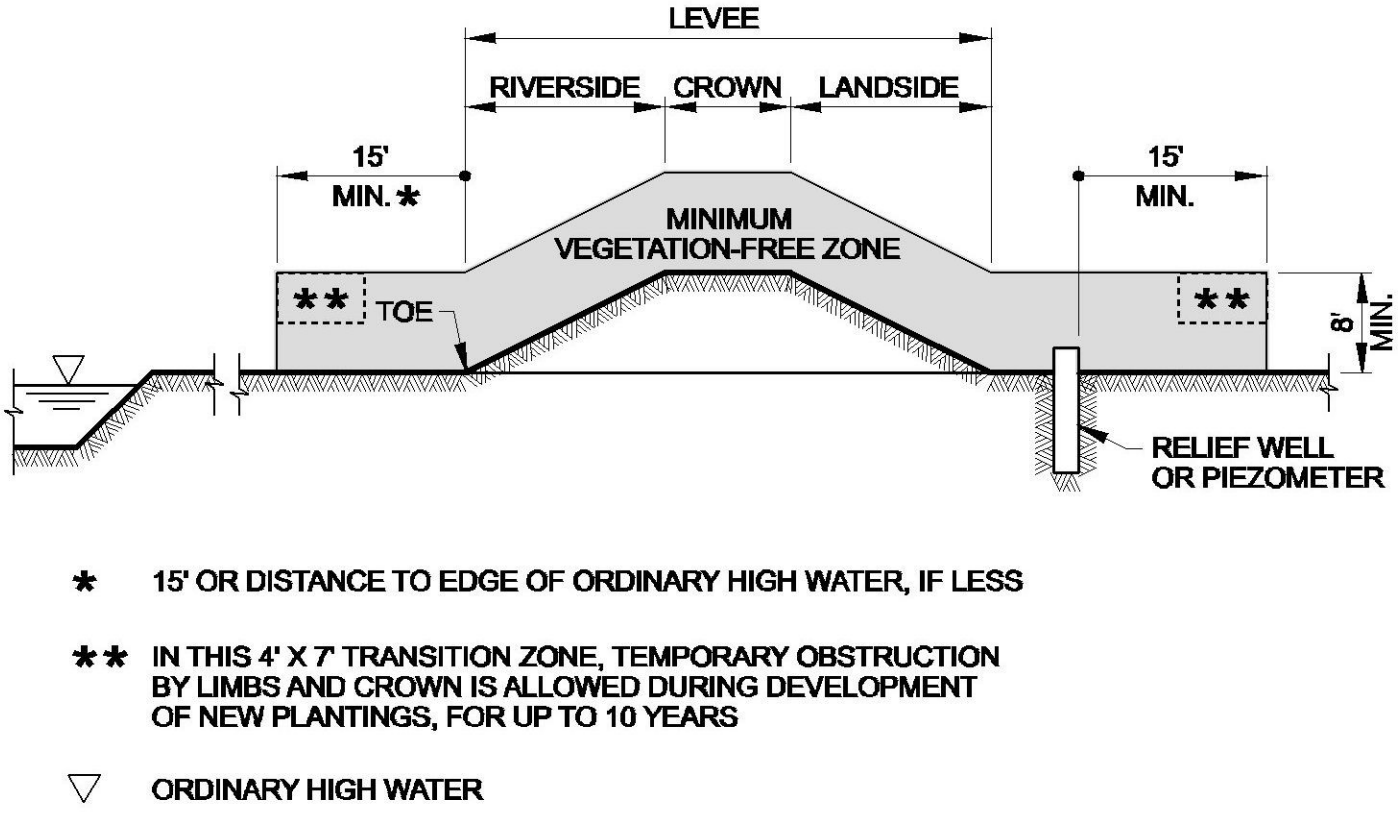
LEVEE
RIVERSIDE
CROWN
LANDSIDE
15' MIN. *
15' MIN.
MINIMUM VEGETATION-FREE ZONE
** TOE
**
8' MIN.
RELIEF WELL OR PIEZOMETER
* 15' OR DISTANCE TO EDGE OF ORDINARY HIGH WATER, IF LESS
** IN THIS 4' X 7' TRANSITION ZONE, TEMPORARY OBSTRUCTION BY LIMBS AND CROWN IS ALLOWED DURING DEVELOPMENT OF NEW PLANTINGS, FOR UP TO 10 YEARS
ORDINARY HIGH WATER

Figure 7: Levee Section with Relief Well or Piezometer

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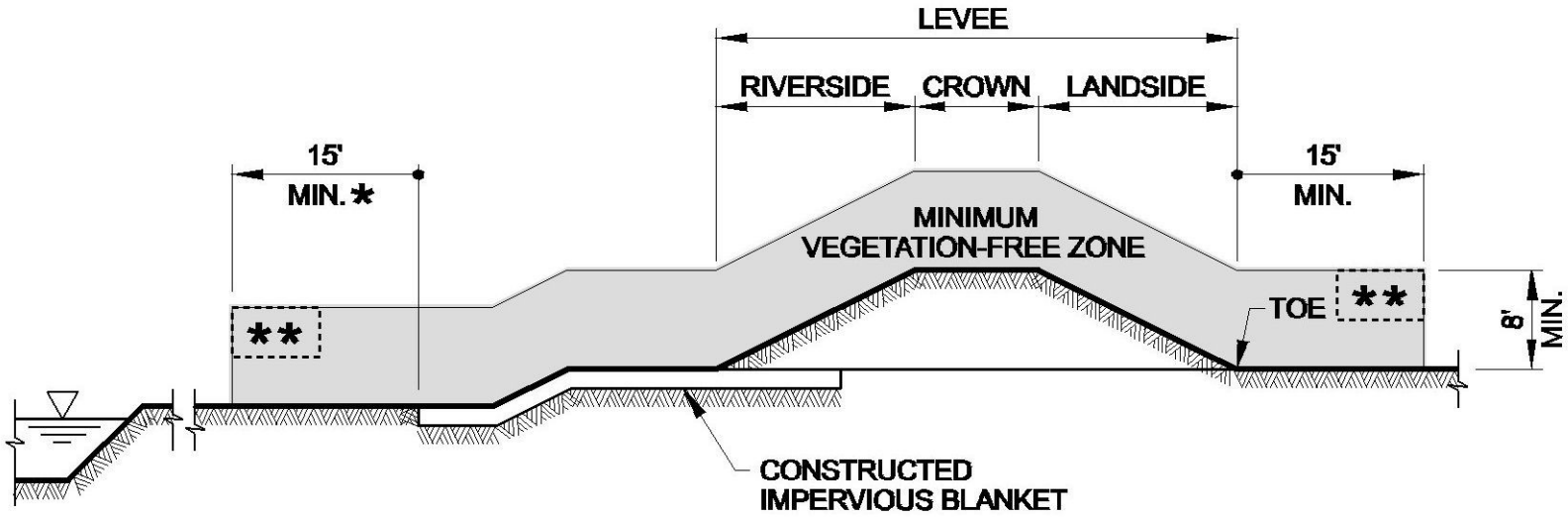
Phase I progress to-date



* 15' OR DISTANCE TO EDGE OF ORDINARY HIGH WATER, IF LESS

** IN THIS 4' X 7' TRANSITION ZONE, TEMPORARY OBSTRUCTION BY LIMBS AND CROWN IS ALLOWED DURING DEVELOPMENT OF NEW PLANTINGS, FOR UP TO 10 YEARS

▽ ORDINARY HIGH WATER

Figure 12: Levee Section with Constructed Impervious Blanket

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Phase I progress to-date

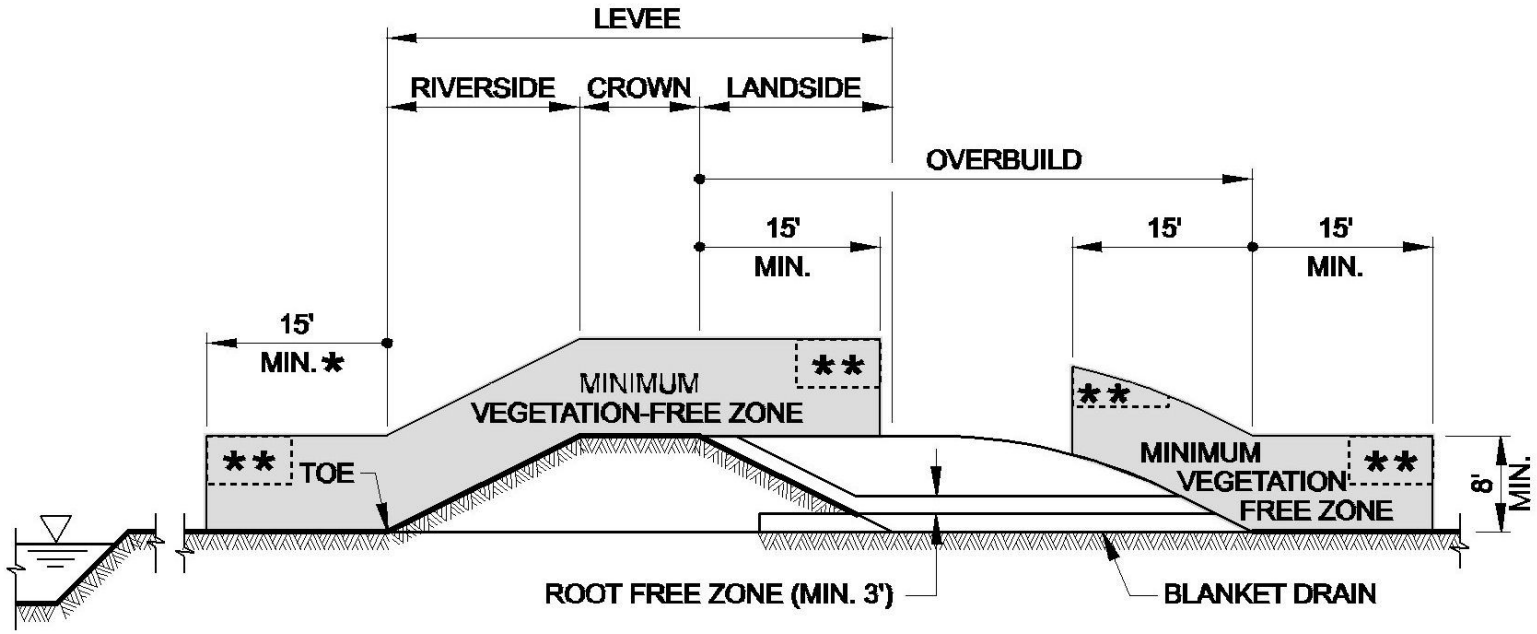

Figure 15: Levee Section with Overbuild and Blanket Drain

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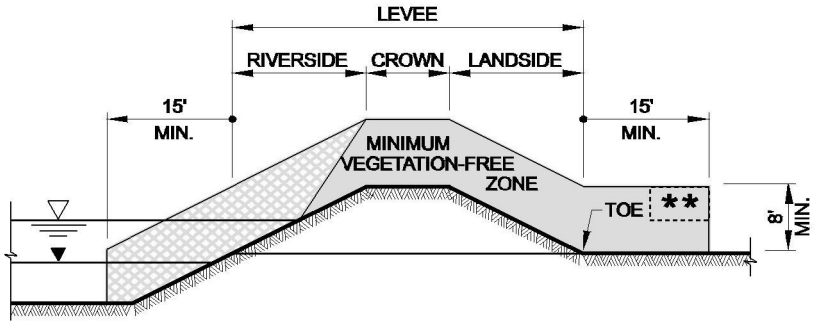
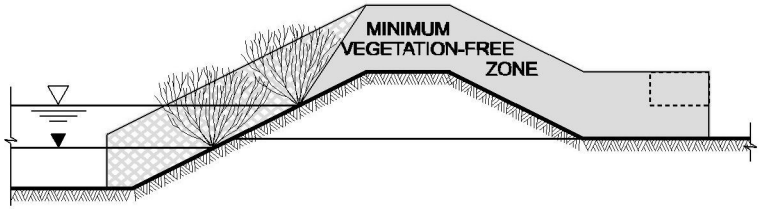


a. SPECIAL ZONE AND VEGETATION-FREE ZONE DEFINED



b. PROPER APPLICATION OF SPECIAL ZONE AND RIVERSIDE VEGETATION-FREE ZONE

NOTE: FOR PROPER APPLICATION OF LANDSIDE VEGETATION-FREE ZONE, SEE FIGURE 2.

** IN THIS 4' X 7' TRANSITION ZONE, TEMPORARY OBSTRUCTION BY LIMBS AND CROWN IS ALLOWED DURING DEVELOPMENT OF NEW PLANTINGS, FOR UP TO 10 YEARS

SPECIAL ZONE – VEGETATION WITH A MAXIMUM CALIPER SIZE OF 2 INCHES IS PERMITTED FOR THE PURPOSE OF EROSION PROTECTION

▽ ORDINARY HIGH WATER

▼ ORDINARY LOW WATER

Figure 16: Levee Section with Ordinary-High-Water Mark Above Riverside Toe

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Phase I Status

- Develop Draft ETL – 95% **(complete in JAN)**
- Develop Scope for Phase II – 65% **(complete in JAN)**
- Conduct an External Peer Review (EPR) **(APR start)**
- Revise DRAFT, issue FINAL ETL **(early to mid 2008)**

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In Conclusion

- Phase I

  No Significant Change to Corps Vegetation Guidelines for FDR Systems

- Phase II

  Will research prompt significant change?